

What is claimed is -:

1. A coin cleaning device for separating foreign objects from a mass of coins inserted into the device, comprising a coin receiving means into which a batch of coins may be inserted, an elongate tray assembly, an inlet end of the tray assembly being so arranged as to receive coins from said coin receiving means, a vibration means connected to said tray assembly and so arranged as in use to cause coins on the tray assembly to travel along the tray assembly in the direction away from said inlet end, the tray assembly comprising an upper shelf and a lower shelf which are substantially horizontal in use, said upper shelf comprising a first upper shelf portion and a second upper shelf portion, said first upper shelf portion being disposed towards said inlet end, and said second upper shelf portion being disposed away from said inlet end, said first upper shelf portion being perforated by apertures of transverse dimensions smaller than a predetermined minimum diameter of coins to be handled by the device, whereby some foreign matter of transverse dimensions smaller than said perforations can fall through said perforations of said first upper shelf portion, said second upper shelf portion being formed with coin receiving apertures of transverse dimensions larger than a predetermined maximum diameter of coins to be handled by the device, whereby coins which travel from on top of said first upper shelf portion to said second upper shelf portion fall through said coin receiving apertures, said lower shelf extending beneath said second upper shelf portion and being provided with perforations of transverse dimensions smaller than said pre-determined minimum diameter of coins whereby any foreign objects which are associated with coins that tumble through said apertures of said second upper shelf portion can pass through said lower shelf, as the coins are conveyed along said lower shelf, a downstream end of said lower shelf, and a coin outlet positioned to receive coins from said downstream end of said lower shelf.

2. A device as in claim 1 comprising an additional shelf portion in said coin outlet, said additional shelf portion being perforated with apertures of transverse dimensions smaller than said minimum coin diameter.
3. A device as in claim 1 comprising a large object collection means positioned to collect any objects that are sufficiently large as not to fall through said apertures of said second upper shelf portion.
4. A device as in claim 3 wherein said large object collection means comprises a chute which is open to the downstream end of said second upper tray portion and extends downwards to a bin.
5. A device as claimed in claim 4 in which said bin is a reject cup of a coin sorter
6. A device as claimed in claim 1 wherein said upper shelf is in the form of a self-contained upper tray, and said lower shelf is in the form of a self-contained lower tray, and wherein said upper tray is spaced from said lower tray by a plurality of rigid spacers, each spacer being associated with a respective releasable fastener, the arrangement being such that when the fasteners are in a secured condition the upper tray is rigidly connected to the lower tray by said spacers and fasteners, and when the fasteners are released the upper tray is removable from the lower tray.
7. A device as in claim 6 wherein said associated spacers and fasteners are located substantially at opposite ends of said upper tray.
8. A device as in claim 7 wherein the combined mass of said spacers and fasteners at said inlet end of the tray assembly is chosen relative to the combined mass of the spacers and fasteners of the downstream end, whereby coins become more spaced-apart as they proceed along said upper and lower trays.

9. A device as claimed in claim 8 wherein said spacers at the downstream end comprise a hollow column having a bore, and the fastener extends through said bore of said column.

10. A device as claimed in claim 8 wherein said spacers at the upstream end are constituted by a single block which extends transversely across the tray assembly and is provided with a plurality of bores, a plurality of laterally-spaced apart fasteners extending through respective bores.

11. A coin cleaning device for separating foreign objects from a mass of coins, comprising first and second shelf portions arranged at first and second heights, vibration means for vibrating both the first and second shelf portions to cause coins on said shelf portions to be conveyed along said shelf portions, said shelf portions each being perforated by apertures of transverse dimensions smaller than a predetermined minimum diameter of coins to be handled by the device, whereby foreign matter of transverse dimensions smaller than the perforations can fall through said perforations, said first shelf portion having an upstream end and a downstream end, said second shelf portion having an upstream end and a downstream end, said shelf portions being arranged in series with one another whereby coins fall from said downstream end of said first shelf portion to tumble downwards to lie on said upstream end of said second shelf portion, and a coin outlet positioned beneath said downstream end of said second shelf portion whereby coins conveyed along said second shelf portion fall into said coin outlet.

12. A coin counting machine for providing a value of a batch of coins inserted into the machine, said machine comprising a machine cabinet, a hopper housed within said cabinet, a coin feeder within said cabinet for feeding coins from said hopper, a coin discriminator housed within said cabinet for discriminating coins fed by said coin feeder, and coin value summation means responsive to said coin discriminator for providing a total value of said coins fed by said coin feeder, wherein said coin counting machine comprises a coin cleaning device as claimed in claim 11 housed within said cabinet, said coin outlet of said coin cleaning device being positioned to direct coins into said hopper.

13. A coin counting machine as in claim 12 wherein said first and second shelves are portions of an elongate tray assembly.

14. A coin counting machine as claimed in claim 13 wherein said cabinet, as viewed in plan comprises a front wall and a rear wall, said hopper is disposed in said cabinet towards said rear wall, and said tray assembly is disposed towards said front wall, said coin outlet of said coin cleaning device being directed substantially transversely of said tray assembly, towards said rear wall.

15. A coin counting machine as claimed in claim 14 wherein said cabinet comprises a top wall formed with an aperture in a position towards said front wall of said cabinet, said aperture opening to said first shelf portion of said tray assembly.

16. A method of separating foreign bodies from a mass of coins comprising causing the coins to be vibrated along an upper shelf provided with perforations of a dimension smaller than a predetermined minimum diameter of coins to be handled, causing the coins to tumble from the downstream end of said upper shelf onto a lower shelf, said lower shelf also being provided with perforations of a dimension smaller than said minimum diameter of coins to be handled and being vibrated to cause the coins to travel along said lower shelf portion, collecting foreign objects that have fallen through said perforations and collecting coins dispensed from the downstream end of said lower shelf.